

In the claims:

1. A method for forming metallurgical connections between wires containing gold and bond pads positioned on integrated circuits having copper interconnecting metallization, comprising the steps of:
 - placing a nickel bath into a state of hydrogen saturation by plating a sufficient surface of dummy material and by maintaining the bath in hydrogen saturation by placing a plating specimen of sufficient size metal in the nickel bath before the following steps of:
 - activating the surface of said copper interconnecting surface, depositing seed metal,
 - plating a layer of nickel barrier metal that resists copper diffusion by electroless deposition in said nickel bath that is in continuous hydrogen saturation; and
 - plating a layer of bondable metal by electroless or immersion deposition.
2. The method of Claim 1 wherein before plating a layer of bondable material, a palladium, platinum, cobalt or other suitable metal layer is plated over said nickel.
3. The method of Claim 2 wherein said bondable material includes gold.
4. The method of Claim 1 wherein before plating said nickel a seed material is deposited.
5. The method of Claim 4 wherein said seed material is palladium.
6. The method of Claim 1 wherein said size of said plating specimen represents a platable surface over 90 percent larger than the copper interconnecting surface.
7. The method of Claim 1 wherein said platable area of said plating specimen is at least double the platable area of the copper interconnecting surface.
8. The method of Claim 1 wherein said plating specimen is copper.
9. The method of Claim 1 wherein said plating specimen is nickel.
10. The method of Claim 1 wherein said plating specimen is a silicon wafer with a copper coating on at least one side.
11. The method of Claim 1 wherein said plating specimen is provided by the steps of pre-cleaning the specimen of copper, nickel or a silicon wafer with a copper coating on at least one side, activating the surface of the specimen, conditioning, and placing in a nickel plating tank until production runs are terminated.
12. The method of Claim 11 wherein said step of placing a nickel bath into a state of hydrogen saturation by plating a sufficient surface of dummy material is provided by starting with blanket copper wafers, pre-cleaning said wafers, activating, conditioning, and electroless nickel plating the blanket copper wafers for 30 minutes.